

A Model of Basking Sharks as a Case Study for Communication

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Project Overview

This interdisciplinary dissertation research was conducted between 2019—2022 by Chelsea Gray, as part of her PhD in Environmental Science and Policy at George Mason University, USA

Background: This research contained three parts:

- (1) The first individual-based model (IBM) of endangered basking shark behavior was developed and used to determine the localized drivers of shark aggregations in Ireland.
- (2) A review of international peer-review publications utilizing marine IBMs was conducted using Web of Science (WoS). The publications were assessed to determine if the WoS articles claimed that the IBMs were relevant or important to marine conservation policy or management and then policy documents were assessed to determine rate of IBM use.
- (3) Interviews with nine individuals who work on marine policy in the Northeast Atlantic were conducted. A one-pager, based off the results from the IBM (part 1), was used to test communication strategies.

Research Findings

- Results from the IBM show that basking sharks gather in aggregations in Ireland for both food and social reasons, likely (based on field observations) for courtship purposes. Food availability drives the number of aggregations, while social aspects drive the size of aggregations.
- IBMs can be used to model the behavior of elusive species, such as basking sharks, but more research is needed on zooplankton distribution to produce a more realistic model environment.
- Despite the majority of marine IBMs claiming relevancy for policy, IBMs are still rarely cited in policy. This is not due to a bias against IBMs, but rather a lack of expertise. Agency employees have a high willingness to try new model methods but require expert advice.
- The one-pager is a useful and efficient format of information dissemination for individuals working at agencies and NGOs. Such individuals would be receptive to receiving one-pagers unsolicited from researchers.
- There is no documented bias against IBMs, but instead a lack of expertise. Agencies and NGOs are open to new model methods but require expert guidance.

Recommendations for Policymakers

- The IBM indicates the importance of these aggregations for both feeding and reproduction, therefore conservation measures to prevent harassment or boat strike in areas/places where these occur should be implemented.
- Further research is needed to understand the localized distribution of zooplankton data, to model the spatial distribution of sharks more realistically. Funding should be allocated for long-term localized zooplankton research.

Recommendations For Researchers

- Researchers should make use of the one-pager communication method, while simultaneously supplying supplemental information (i.e., associated peer-reviewed publication), when reaching out to agencies or NGOs. Policy recommendations in one-pagers should be catered to the agency or NGO that the one-pager is sent to.
- Researchers who use IBMs should anticipate that even those with scientific backgrounds will likely be unfamiliar with IBMs and will filter their understanding of the model method through their experience with more traditional models. Readers may be biased to assume models are quantitative and predictive.

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